

***Formica balcanina* sp. n., a new species related to the *Formica cinerea*-group  
(Hymenoptera: Formicidae)**

IVAN Z. PETROV<sup>1</sup> & CEDRIC A. COLLINGWOOD<sup>2</sup>

<sup>1</sup>Institute of Zoology, Faculty of Biology, University of Belgrade, 16, Studentski trg,  
11000 Belgrade, Yugoslavia

<sup>2</sup>City Museum, Municipal Buildings, Leeds LS1 3AA, UK

**Taxonomy.** *Formica balcanina* sp. n., Hymenoptera, Formicidae, Serbia

**Abstract.** *Formica balcanina* sp. n. is described and illustrated from Deliblatska peščara (Deliblato Sandy Area), Serbia. This species belongs to the *Formica cinerea*-group, with closest resemblance to *F. selysi* Bondroit, 1918.

INTRODUCTION

The *Formica cinerea* Mayr complex in Europe includes several species. *F. cinerea* Mayr, 1853 has been verified from North Italy (lake Garda, leg. C. Bisgaard; Ponte di Alpi, leg. C.A.C.) to Central Finland – Lat. 63 and from Switzerland to the Urals and Poland (Kutter, 1977). *F. selysi* Bondroit, 1918 is found in the upper reaches of the rivers Rhine and Rhone and their tributaries and as far west as the Landes in France and east to the northwest border of Italy at Gorizia and also from Piedmont (leg. C.A.C.). *F. torrentium* Bernard, 1968 occurs in the French Pyrenees and north-western Spain to Oviedo. *F. lefrancoisi* Bondroit, 1918 has a restricted distribution from the foothills of the French Jura through Switzerland, often in urban areas, and also Corsica (leg. C.A.C.).

Seven species related to *Formica fusca* L. are known from Serbia and the adjoining territories formerly incorporated within Yugoslavia (Agosti & Collingwood, 1987; Petrov & Collingwood, 1992). A species long known as *F. cinerea* Mayr has been compared with *F. cinerea* samples from Central and North Europe and with descriptions by Dlussky & Pisarski (1971) and Kutter (1977, 1978) and found to be recognisably different. It is here described as *F. balcanina* and replaces *F. cinerea* in Serbia and surrounding territories and other Balkan states including Bulgaria as well as northern Greece and north-western Turkey (sp. 2 in Agosti & Collingwood, 1987).

*Formica balcanina* sp. n.

**WORKER.** The head, dorsal face of the promesonotum, propodeum and gaster are dark brown; the sides of the promesonotum and scapes reddish brown and the legs and the petiole pale brown. The funicular segments darken evenly from base to apex. Body length ranges from 3.4–6.7 mm and the cephalic index varies from 66.7–93.3.

Mandibles longitudinally striate with scattered hair pits. Each mandible has 8 teeth including a long apical and a blunt basal tooth (Fig. 1A, B). The clypeal margin is convex

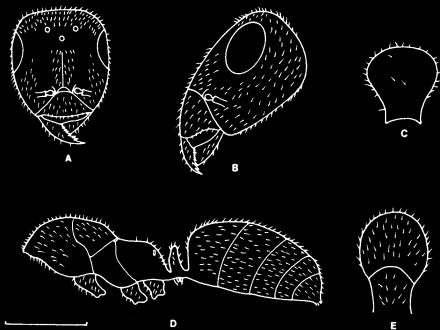


Fig. 1. *Formica balcanina* sp. n., worker: Head (A, B), petiole (C), body (D), promesonotum (E). Scale: 1 mm.

and entire. The head and alitrunk are of general *Formica* shape. The head has rounded occipital corners and the genae below the eyes curve gently towards the mandible insertions (Fig. 1A). The propodeum in profile is slightly angled (Fig. 1D). The petiole in lateral view has the anterior face slightly convex (Fig. 1D), in frontal view it is convex dorsally and laterally (Fig. 1C).

The head has numerous outstanding pale hairs which extend round the whole occiput and head sides to the mandible insertions (Fig. 1A). The gula hairs are numerous (Fig. 1B). The scapes are without erect hairs. The promesonotum and gaster dorsum have numerous erect hairs (Fig. 1D, E). The propodeum has less numerous erect hairs which occur both lateral and dorsal to the declivous face (Fig. 1D). The petiole is surrounded with many erect hairs. The femora have erect hairs laterally and on the flexor surface but not on the extensor surface (Fig. 2C). There is fine silvery pubescence all over the head, alitrunk and petiole, with longer denser pubescence on the gaster. The whole body is dull with the fine reticulopunctate sculpture more or less concealed by pubescence.

**QUEEN.** The whole body is brownish-black with the space and the legs paler. Body length 8.5 mm.

Chaetotaxy and pubescence as in the worker with more than 20 erect hairs on the genal margins between the eyes and the mandibles (Fig. 3). The petiole has many hairs on the side margins but none on the dorsum. Erect hairs are present on the flexor and lateral surfaces of the femora but not on the extensor. Silvery pubescence covers the whole body

except for the scutellum where pubescence is sparse with the bare median band. The body is finely reticulopunctate, more coarsely punctate on the mesonotum.

**MALE.** The head and alitrunk are brownish-black, the antennae and gaster slightly paler and legs and genitalia yellow. Body length 7.5 mm.

Mandibles with a large apical tooth and 4 smaller, including the slightly offset basal. The clypeus projects forward over the base of the mandibles, convex in lateral view, without a median keel (Fig. 4). The head is broadest posteriorly converging below the convex eyes towards the mandibles (Fig. 4). The eyes have short erect hairs and longer semi-erect hairs present all over the head, alitrunk, flexor surfaces of the tibiae and femora, the upper part of the declivous face of the first gaster tergite and on the dorsum of the second and remaining tergites. The whole body is covered with silvery pubescence. The subgenital plate is spatulate projecting forward in a sigmoid curve. The squamula projects backward above the stipes which has a distinct sclerotized flange on the hind margin.

**MATERIAL STUDIED.** Holotype (1 imago worker marked by No 85/H) and paratype (29 imago workers marked by No 85/P) are described from a number of specimens collected in sandy soil at Rošijana, Deliblatska peščara (Serbia), 15.vii.1987. *F. balcanina* has now been confirmed from Belgrade, Kruševac, Veliki Kupci, Beljanica (Serbia). This material is stored at the Institute of Zoology, Faculty of Biology, Belgrade.

Paratype queens are described from Mokra Gora (Serbia), 6.vi.1985, and paratype males from Vihren (Bulgaria), 31.vi.1985, taken in each case with workers of the new species. These paratypes, as well as some worker paratypes found at Vlasinsko jezero, Niš, Pirot, Cernica (Serbia), Mt. Durmitor (Montenegro), Jajce, Foča (Bosnia), Kajmakčalan (Macedonia), Kastoria, Cairn and Drosopygy in northern Greece and from Everskirt and Yedi Golar in north-western Anatolia are stored in the collection of C.A. Collingwood.

Type and reference material have been card mounted and the rest preserved in tubes with 70% ethanol and glycerol.

The name of the species has been derived from the Balkan Peninsula where it is widely distributed.

**DIFFERENTIAL DIAGNOSIS.** *F. balcanina* sp. n. is taxonomically closest to *F. selysi* Bon-droit. Both species have abundant head pilosity with many projecting hairs below the eyes to genae (Figs. 1A, B; 5B), absent in the other species. *F. balcanina* differs from *F. selysi*

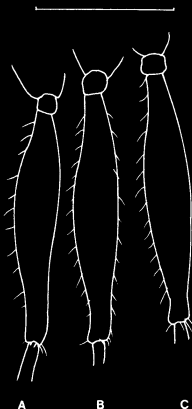
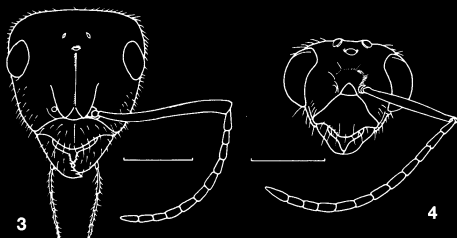


Fig. 2. Hind femora of workers: *F. cinerea* (A), *F. selysi* (B), *F. balcanina* sp. n. (C). Scale: 1 mm.



Figs 3–4: *Formica balcanina* sp. n. 3 – female head; 4 – male head. Scale: 1 mm.

in the absence of projecting hairs on the extensor surface of the femora (Fig. 2B, C) in all castes and the more numerous hairs on the propodeum in the worker.

**BIOLOGY.** The type locality, Deliblatska peščara, is situated in Serbia about 70 km north-east of Belgrade. It covers about 25,000 hectares and presents a part of the Pannonian Plain. Its altitude ranges from 75 m on the southeast part (near river Danube), up to 193 m on the northwest part.

It is characterized by many peculiarities concerning its soil (sandy and dry, partly represented by quick sand). However, due to the succession of some phytocenological associations (such as *Corispermato-Polygonetum arenariae*, *Festucetum vaginatae delibaticum*,

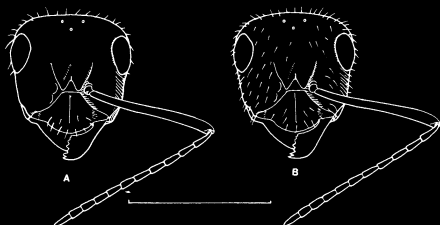


Fig. 5. *Formica cinerea*, worker head (A), *F. selysi*, worker head (B). Scale: 1 mm.

Koelerieto-Festucetum Wagnerii, Chrysopogonetum pannonicum, Festuceto-Potentilletum arenariae), as well as due to artificial afforestation, the quick sand is mostly bound and rare today. The climate of Deliblatska peščara shows great diurnal and seasonal fluctuations of temperature and quantity and temporality of rainfall during the year, which are different from those in the surrounding environment.

Actually, Deliblatska peščara presents one "oasis" of preserved semi-desert and desert habitats.

The paratype queen and paratype male were taken with other queens and males as well as workers in all cases from stream and river sides in sandy and stony soils with sparse vegetation and subject to occasional flooding. The characteristic habitat for this species most closely agrees with that of *F. selysi* rather than with *F. cinerea* which occupies stretches of open forest in Central Europe, coastal sands and meadows in Jutland and southern Sweden and sandy areas in open forest in Fennoscandia.

Single nests of *F. balcanina* were occasionally encountered, but in open areas alongside rivers large polycalic colonies were observed usually with several queens in each group of nests. Foraging workers were not seen to make trails but were widely dispersed over a wide area. At some sites workers were ascending poplar trees (*Populus* spp.) to attend Aphidae, but this species is considered to be mainly a scavenger and predator as Dlussky (1967) described for *F. cinerea*, in forest land in Russia.

#### Key to the workers of the *Formica cinerea* Mayr complex in Europe

- 1 Dark species with at most part of the mesonotum and genae above the mandibles reddish ..... 2
- Alitrunk entirely or mainly red ..... *imitans* Ruzsky, *subpilosa* Ruzsky
- 2(1) Head in full dorsal view with projecting hairs continuing round occiput to the genae below the eyes ..... 3
- Head in full dorsal view with projecting hairs restricted to occiput but not present on genae below the eyes ..... 5
- 3(2) Femora with a row of outstanding hairs on the upper extensor surface (Fig. 2B) - Switzerland, France, northern Italy, mainly riversides ..... *selysi* Bondroit
- Femora without projecting hairs on the extensor surface except one or two at the proximal end only ..... 4
- 4(3) Propodeum with abundant projecting dorsal hairs and occasional hairs at the proximal end of the upper surface of the hind femora - northern Spain and Pyrenees ..... *torrentium* Bernard
- Propodeum with relatively few projecting dorsal hairs and none on the extensor surfaces of the femora (Fig. 2C) - Balkans, Bulgaria, northern Greece, north-western Turkey ..... *balcanina* sp. n.
- 5 In full dorsal view occipital hairs project round occipital corners only; propodeum with one or two dorsal hairs at most - Jura mts, Switzerland, Corsica - town gardens and woodlands ..... *lefrancoisi* Bondroit
- In full dorsal view occipital hairs project in a continuous fringe around the occiput to eye level (Fig. 5A), propodeum with at least a few dorsal hairs - northern Italy to central Finland, Switzerland to the Urals ..... *cinerea* Mayr

#### REFERENCES

- AGOSTI D. & COLLINGWOOD C.A. 1987: A provisional list of the Balkan ants (Hym., Formicidae) and the key to the worker caste: synonymic list. *Bull. Soc. Entomol. Suisse* 60: 51-62.
- DLUSSKY G.M. 1967: (*Ants of the genus Formica*). Nauka, Moscow, 236 pp. (in Russian).

- DUSSKY G.M. & PISARSKI B. 1971: Rewizja polskich mrowek (Hymenoptera, Formicidae) z rodzaju *Formica* L. [Revision of the Polish ants (Hymenoptera, Formicidae) of the genus *Formica* L.]. *Fragm. Faun. (Warszawa)* **16**(12): 145–224. (in Polish).
- KÜTTER H. 1977: Fauna Hymenoptera, Formicidae. *Insecta Helvetica* 6. Schweizerischen Entomologischen Gesellschaft, Zurich, 298 pp.
- KÜTTER H. 1978: Fauna Hymenoptera, Formicidae. *Insecta Helvetica, Ergänzungsband 6a*. Schweizerischen Entomologischen Gesellschaft, Zurich, 100 pp.
- PETROV I.Z. & COLLINGWOOD C.A. 1992: Survey of the myrmecofauna (Formicidae, Hymenoptera) of Yugoslavia. *Arch. Biol. Sci. (Belgrade)* **44**(1-2): 79–91.

Received July 28, 1992; accepted January 20, 1993